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Dear Ms. Heisel:

We appreciate the opportunity to submit the following comments to the Fire Suppression Interim Committee as part of its review of wildland fire policy. These issues are important to all Montanans and we would welcome the occasion to work with the Committee further as it considers these topics.

Summary

We appreciate the Committee's interest in the interplay between forest fires, public costs, safety, property protection, effective fire planning, climate change, and the long-term health of our forests. Fires always have played a role in Montana's forests and the combination of climate change, drought, past forest management practices, increasing temperatures, and ever expanding population means that fires will impact Montana more in the future rather than less.

Protecting communities from fire must be the top priority. Significant research by the Forest Service and other scientists, much of it done in Montana, shows that work in and around homes does the most to protect structures, provides the biggest 'bang for the buck,' and increases public and firefighter safety. In areas farther from communities, prescribed burns and wildland fire use provide more effective and efficient ways to address fire and related issues of public cost, safety, and long-term forest health. Furthermore, such restored forests are much more resilient to future severe wildfires, thus increasing public safety while reducing costs in the coming years.

Fires Have Always Been a Part of Montana Forests

Fires have always been part of the forests of Montana.[1] They are a natural and fundamental component of our forest ecosystems and are critical for maintaining wildlife habitat, cycling nutrients that keep forests healthy, and reducing hazardous fuels. Montana's forests experience different fire behavior and timing, depending on their location and species composition. Natural fire in Montana can range from frequent surface fires in grasslands (which cover a large part of the state) to fires that replace entire stands in high elevations.[2] Low-elevation forests' fire patterns tend to be those most altered due to fire suppression and other land management activities; the high-elevation forests' patterns remain generally intact.

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[1] Brunelle, A., C. Whitlock, P. Bartlein, and K. Kipfmueller. 2005. Holocene fire and vegetation along environmental gradients in the Northern Rocky Mountains. Quaternary Science Reviews 24:2281-2300.

[2] In general, forests in Montana can be grouped into three types, according to the Montana Forest Restoration Committee (see http://www.montanarestoration.org/restoration/appendix_B, last viewed 01/23/08). These types are: (a) *low to mid elevation ponderosa pine, Douglas-fir, and western larch forests* with a low and mixed severity fire regime and average fire return intervals of 5 to 30 years; (b) m*id elevation lodgepole pine, Douglas-fir, and subalpine fir forests* with dense stand structures that historically experienced mixed and stand replacing fires regimes with average fire return intervals between 30 and 200 years; and (c) h*igh elevation subalpine fir, lodgepole pine and Englemann spruce forests* that historically experienced fires on a 200 -300 year fire return interval.

While natural fire has always been a part of Montana's landscapes, a variety of factors have resulted in more severe fire seasons in recent years, including some of the most extensive wildfire seasons in the State's recorded history.[3] These factors include **long-term drought** in Montana, **reduced snow pack**, past forest management activities (logging and grazing) which have led to **dense regeneration of shade tolerant species**, and **past fire suppression** policies that resulted in **fuel accumulation.** These factors are particularly evident in low-elevation forests where historically low to mixed severity fires reduced fuel loading with some regularity. When we add **climate change** to this list of factors, along with more and **more people moving into the 'wildland-urban interface (WUI)**, the future almost certainly holds more fires and more fires near communities. A hotter and drier climate will bring with it a longer fire season and an increase in the number of fires. In fact, research has shown that the greatest absolute increase in large fires in the U.S. since the mid-1980s has occurred in the forests of the Northern Rockies, which were most affected by changes in climate that brought earlier springs and reduced snowmelt.[4] Westerling and others [4] demonstrated that the middle to high elevation forests in the northern Rockies are experiencing the greatest increase in the length of fire season and thus the elevation most vulnerable to increased occurrence of wildfire.

<u>Focus on What Works – Protecting Communities</u>

People in Montana are understandably concerned about the impact that fire will have on their lives and livelihoods, and protecting Montana communities is the highest priority. Over four of the last seven years, the federal government spent more than $1 billion fighting fires and Montana alone spent $107.4 million to suppress fires during the last fire season (after subtracting reimbursable costs, Montana still paid $42.7 million).[5] With the wildland-urban interface likely to grow larger each year in Montana[6], there will never be enough resources to suppress all fires. To manage fire and learn to better live with fire, we need to focus on what works - protecting our homes and communities from fire is far more effective than attempting to protect forests from fire. That means we should prioritize hazardous fuels reduction work in the "community fire planning zone" – the area around communities that should be managed to protect homes and structures from wildland fire.[7]

Research by the Forest Service, much of it done by the USFS lab in Missoula, has shown that, in combination with proper building materials and maintenance, fuel modification within a "home ignitability zone" of approximately 60 meters can change wildfire intensity and duration enough to prevent a home from igniting, even under extreme weather conditions.[8] Beyond this "home ignitability zone" communities should thin fuels to reduce the probability of a crown fire or protect water supplies. We strongly support these recommendations. Generally a buffer of a half mile around a community is a sufficient "community fire planning zone". This does not mean that this entire half-mile buffer should be cleared, but rather that this is the area within which to look for opportunities to treat fuels to protect homes. Hazardous fuels treatments are most effective when they are combined with activities that make homes more resilient to fire. These "Firewise" activities include using fire-resistant building materials, such as metal or slate, when building or remodeling; cleaning the roof and gutters regularly;

[3] MT DNR. 2007. *State Wildfire Suppression and the Wildland Urban Interface.*

[4] Westerling et. al. 2006. "Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity" in *Science.*

[5] Smith, Barbara, MT Legislative Fiscal Division. 2007. *Fire Suppression Costs FY2008 – A Report Prepared for the Legislative Finance Committee.*

[6] Rasker, Ray et. al., Headwaters Economics, *Wildfire Costs Will Soar if Building Trends Continue: Montana Summary* (located at http://headwaterseconomics.org/wildfire/mt.php, last viewed 1/24/08).

[7] Aplet and Wilmer. 2006. *Managing the Landscape for Fire: A Three-Zone, Landscape-Scale Fire Management Strategy. The Wilderness Society.*

[8] Cohen, J. 2000. Preventing disaster: home ignitability in the wildlandurban interface. Journal of Forestry 98: 15-21.

landscaping with less-flammable and fire-resistant plants; and stacking firewood at least 100 feet away and uphill from the home, among others.[9]

Currently, Montana has eight areas that are recognized as Firewise Communities.[10] We recommend that the Montana legislature consider creating incentives to encourage more communities to become "Firewise". The Community Wildfire Protection Plan (CWPP) [11] process, where communities and agencies collaborate to plan for wildland fire, including defining their WUI area, identifying priority areas for treatment, and determining structure protection needs, also provides an excellent opportunity for citizens and agency managers to work together to achieve common fire management goals. As of March 2006 (the most recent data available), the Western State Foresters reported that Montana had 19 CWPPs in place and is working on 23 more.[12] The legislature also should consider incentives to encourage communities to engage in this process.

Prioritizing Work to Save Taxpayer Money and Improve Safety

Focusing our efforts on the wildland-urban interface is key for a number of reasons. First, because hazardous fuels treatments are expensive[13] and require consistent maintenance, it makes sense to focus work in areas that will provide the "biggest bang for the buck" – near communities. Second, because wildland fires are significantly more expensive to suppress in the WUI, it makes sense to focus our preparedness and fuels mitigation efforts there. Montana's DNR found that, from 1996-2006, fires in the WUI cost an average of 46% more to suppress than those in the non-WUI.[14] Lastly, when homeowners create defensible space around their structures and fuels are reduced around a community, this gives firefighters more safe space to work when suppressing fires in the WUI.

Beyond Communities, Saving Taxpayer Dollars and Restoring Forests

Beyond the wildland-urban interface, other strategies are needed and the focus must be on restoring natural, healthy forest conditions to make forests more resilient to natural disturbances including wildfire or insect infestations. While suppression and mechanical treatment may be necessary in some areas beyond the WUI, the primary focus should be on protecting critical resource values and maintaining a fire-resilient forest. Treatments should generally be focused on those forests most altered from their historical state - low-elevation, frequent fire forests. Assessments must be made on a local basis, using the best science available for particular locations (tree-ring evidence, historical photos, paleoecological tools). Often the best tool in these areas will be prescribed fire. Prescribed fire is particularly beneficial because it is less expensive than mechanical treatment and it begins to reintroduce a more natural fire pattern in these areas, making them more resilient to future fires and increasing long-term public safety while reducing future costs.

Climate change is resulting in longer fire seasons, greater propensity for drought conditions, and higher summer temperatures. These climatic changes are more potent drivers of increased fire occurrence and severity than fuel accumulation, particularly in the Northern Rockies. Therefore, extensive mechanical

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[9] www.firewise.org (last viewed 1/24/08).

[10] According to a January 11, 2008 Memo for Rep. Bill Wilson prepared by Leanne Heisel, the following eight areas are recognized as Firewise Communities in MT: Sorrell Springs, Frenchtown; Big Fork, Big Fork; Em Kayan Village, Libby; Elkhorn, Whitefish; Cathedral Mountain Ranch, Nye; Chain of Lakes, Libby; North Fork Flathead, Polebridge; Montana City Fire District, Montana City. This memo can be found at http://leg.mt.gov/content/committees/interim/2007_2008/fire_suppression/staff_reports/WUI_IR.pdf.

[11] The CWPP process was instituted in the Healthy Forests Restoration Act of 2003 (P.L. 108-48).

[12] Council of Western State Foresters (2006). *Community Wildfire Protection Planning in the West: A Status Report.*

[13] Research has shown that the cost of such treatment generally runs from $500 to $1500 per acre for mechanical thinning, Barbour, R.J., R.D. Fight, G.A. Christensen, G.L. Pinjuv, and V. Nagubadi. 2001. Assessing the Need, Costs, and Potential Benefits of Prescribed Fire and Mechanical Treatments to Reduce Fire Hazard in Montana and New Mexico. Report to the Joint Fire Sciences Program. (http://www.fs.fed.us/pnw/woodquality/JLMFinal_report_dft5.PDF).

[14] MT DNR. 2007. *State Wildfire Suppression and the Wildland Urban Interface.*

fuel treatment beyond the WUI and outside of the low fire severity (dry) forest type is not a cost-effective or feasible solution to fire management. Thinning and forest management are in no way a guarantee against the occurrence of fire. In Montana and the West, there are many examples of where thinning far away from communities had no impact on a fire, along with examples of where it did impact fire behavior, sometimes in unexpected ways. Drought and temperature remain the key factors influencing fire occurrence and severity, not forest fuels, and therefore, not thinning.

Well beyond a community, in areas away from people and property, one of the best ways to reduce the long-term risk of future severe, catastrophic fire, while also saving taxpayer dollars by reducing suppression costs, is to allow fire to play its natural, historical role, particularly by utilizing Wildland Fire Use (or WFU).[15]

Therefore, public funds are best used suppressing those fires that threaten communities while allowing some of the fires away from communities to play their natural role in maintaining healthy ecosystems. Managing fires in this way has proven successful in Montana. Between 1934 and the early 1980s, all fires in the 1.5 million-acre Bob Marshall Wilderness complex were suppressed and only 3,000 acres burned, resulting in much of the forest in the Bob being the same age and highly susceptible to fire. For the past two decades, the Forest Service has allowed about half of the lightning strike fires to burn in the Bob, resulting in 340,000 acres being burned - roughly 22 percent of the Wilderness Area. That has created more diversity across the landscape, including increased browse growth for wildlife.

Equally important, this policy has improved the Forest Service's ability to manage fires. For example, there were three big fires in the Bob Marshall Wilderness complex in 2007, including the Conger Creek fire, which burned inside the perimeter of two previous fires, the Canyon Creek fire and the Cabin Creek fire. The Forest Service spent $900,000 herding the Conger Creek fire and it grew to only 25,000 acres, simply because the Canyon Creek and Cabin Creek fires had eaten so much fuel in the recent past. By comparison, last summer the Forest Service actively fought the two other fires, Ahorn and Fool Creek, both in areas that had not burned in 1988, and spent $25 million doing so. Notwithstanding those efforts, the two fires grew to 52,000 and 60,000 acres, respectively. This shows the value to taxpayers, in this case $24 million, of utilizing the option of fighting fire with fire.[16]

Roads: More Roads More Often Mean More Fire

It is important to note that fires are more likely to ignite in roaded areas than in unroaded areas, and Forest Service research shows that the majority of large fires have started in roaded areas rather than unroaded areas [17]. In the Columbia River Basin assessment, it was found that 81 percent of the subbasins classified as having the highest forest integrity had large compositions of Wilderness and roadless areas.[18] It also was found that road density was indirectly correlated with the probability of fire occurrence due to human-caused ignitions; meaning managed forests had higher potential for human-caused fires. Nationwide, there were 80,220 human caused fire starts over the last eight years,

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[15] WFU is" the practice of actively managing naturally-ignited fires in predetermined areas to achieve resource benefits." From U.S. Forest Service, FY2008 Budget Justification, Chapter 11, page 10.

[16] Manning, Richard. 2007. *Our Trial By Fire* in On Earth, *an Independent Publication of the Natural Resources Defense Council (http://www.onearth.org/article/our-trial-by-fire?page=3). This article quotes George Weldon, the Forest Service's* deputy director for fire, aviation, and air in the Forest Service's Northern Region.

[17] United States Department of Agriculture, F. S. 2000. Roadless Area Conservation Final Environmental Impact Statement. Volume 1, USDA

[18] Quigley, T. M., and S. J. Arbelbide. 1997. An assessment of ecosystem components in the interior Columbia Basin and portions of the Klamath and Great Basins: volume 2. PNW-GTR 405, United States Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.

but only 16,165 lightning-caused fire starts.[19] Within Wilderness areas, the primary cause of fire is lightning with very few incidences of human caused fires. Furthermore, on the average, Wilderness areas are more likely to be far from communities than managed forests. This greatly decreases the potential for human-caused fire starts in Wilderness areas and greatly decreases the potential for fire to move from Wilderness areas into communities.

Biomass Energy – Uses and Limitations

Where fuel treatments are effective and necessary, like near communities, it's possible to utilize some of the by-products from these treatments to create biomass energy. This is important because much of this fuel is small in diameter and traditionally there have been limited commercial uses for it, meaning that there has been little incentive to remove it and much of it ended up in landfills. Biomass represents a renewable resource and an opportunity to reduce greenhouse gas emissions from petroleum. That said, while producing biofuels from hazardous fuels treatments might seem like an elegant solution to our fire management problem, the issue is fairly complicated. First, biomass is extremely bulky and difficult to transport and store. Second, the supply of biomass is perhaps more limited in availability that commonly thought as hazardous fuels reduction is effective only in certain areas. And finally, there are environmental and logistical limitations to biomass and biofuel (cellulosic ethanol) production that are not currently being considered.

Forest biomass, especially small trees and underbrush, represents a bulky, low density feedstock making transportation and storage a significant logistical problem. Right now, break-even hauling distances are estimated at about 50 miles, thus creating intense local demands on forest resources. For example, a midsized ethanol plant (producing 20 million gallons of ethanol per year) requires about 244,000 tons of biomass each year. This is equivalent to one football field of biomass piled more than a mile high. Assuming 50 miles per delivery, this would require 400,000 transit miles for biomass delivery to one ethanol plant each year.

Using Seeley Lake as an example of a heavily wooded area in western Montana, we can envision the potential limitations to the local production of cellulosic ethanol. Within a 50 mile radius of Seeley Lake there are about 1.2 million acres of private and public forest lands that are readily available for timber harvest [20]. Of that, about 40 percent of land area is suitable for mechanical thinning and fuel reduction harvest. Thus, on a 30-year rotation, this plant could yield a maximum of less than 8 million gallons ethanol annually -- what would be considered a small ethanol plant. Producing biofuels from woody biomass as a byproduct of fuels treatment is certainly a tool in our toolbox, but we have to be careful not to consider it a panacea.

Cellulosic ethanol production requires a lot of water and degrades water quality. Each gallon of ethanol produced consumes (water driven off as vapor) about 4 gallons of water (currently estimated at closer to 6 gallons for cellulosic ethanol), therefore a 20 million gallon per year ethanol plant will consume at least 80 million gallons of water annually. In dry western states, this may be a significant impediment. Water is also chemically and thermally altered within ethanol plants and must be treated prior to return to natural water bodies. A 20 million gallon per year plant would annually concentrate 1.4 million pounds of nitrogen and 120,000 pounds of phosphorus in the local waste water stream.

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[19] www.nifc.gov

[20] DeLuca, T.H. 2007. Ecological concerns of forest biomass based cellulosic ethanol production. Biofuels, carbon, and policy, Minneapolis MN. October, 2007 (http://www.biofuels.umn.edu/documents.html)

Conclusions

Montana and nearby states have well-trained, well-funded professional firefighters, and we appreciate their work and dedication. Employing new technology, there were able to extinguish 98 percent of all fires in their jurisdiction within a few hours, during the 2007 fire season.[21] Near communities and important watersheds, these fire suppression efforts are entirely appropriate. Incentives to help communities Firewise their homes and treat nearby lands also must be encouraged to better focus firefighting efforts when fires do occur.

Farther from communities, however, the effort to fight every fire is having significant unintended and negative consequences. Interrupting natural fire patterns has thrown ecosystems and fire cycles out of balance, and in many places, has actually increased the risk of severe fire. When past fire suppression and the impacts of past logging activities are combined with the impacts of climate change (increased temperatures, longer fire seasons, and increased drought), uncommonly severe fires can erupt that threaten communities and important natural resources while contributing to skyrocketing suppression expenditures.

This pattern is not sustainable and we urge the Committee to consider a variety of tools when thinking about fire management. We should concentrate on creating fire-resistant communities in healthy, fire-resilient landscapes. That means focusing suppression and fuels treatment efforts to protect communities, empowering homeowners to protect themselves and make their communities Firesafe, and using fire as a tool to restore forests and reduce future suppression costs.

Thank you again for the opportunity to comment on these important issues. We would be pleased to provide any additional information of interest to the Committee in the future.

Sincerely,

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[21] Manning, Richard. 2007. *Our Trial By Fire* in On Earth, *an Independent Publication of the Natural Resources Defense Council (http://www.onearth.org/article/our-trial-by-fire?page=3). This article quotes George Weldon, the Forest Service's* deputy director for fire, aviation, and air in the Forest Service's Northern Region.